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October 3, 2000

~~Mr. Kirk Stevens, Code EV23KS~~

Atlantic Division, NAVFACENGCOM
LRA, Building A, Room 3200
6506 Hampton Blvd.
Norfolk, VA 23508

Re: Evaluation of On-site and Off-site Laboratory Analysis Procedures and Correlation
Site 89 TCRA
Contract No. N62470-97-D-5000, Task Order 050
MCB, Camp Lejeune, NC

Dear Mr. Stevens,

This letter submittal summarizes the results of the recent study of the on-site and off-site laboratories supporting the current TCRA at Site 89. The dual purpose of this study was to determine a correlation between laboratory results, and to validate the procedure whereby individual sample extracts are combined in the laboratory to yield a "composite" result for volatiles analysis.

INTRODUCTION

Under the LANTDIV RAC program, OHM is currently conducting a Time Critical Removal Action (TCRA) at MCB Camp Lejeune, North Carolina involving the treatment of VOC contaminated soils using Low Temperature Thermal Desorption (LTTD). As a supporting activity to this removal, OHM has established an on-site mobile laboratory at the project site to conduct analyses on waters and soils for the project constituents of concern (COC) indicator compounds, PCA, PCE and TCE.

For the analysis of LTTD feed soils and treated soils, OHM proposed to generate a composite sample of the 200-ton soil lots scheduled for treatment. As field compositing of soil samples for volatiles analysis is an unacceptable procedure, OHM proposed having the off-site confirmation laboratory receive and extract each received sample individually and then combine portions of the six individual sample extracts for analysis. OHM has successfully employed this technique on other projects, providing quality data while minimizing off site analytical costs, as one analysis is paid for per 200 ton soil lot, as opposed to six analyses. Due to the fixed costs and limited resources associated with a field lab, it was proposed the on-site lab would extract and analyze the six individual samples per 200 ton lot, and report the average concentration of the six analyses as the sample result.

ANALYTICAL METHODS AND STUDY DESIGN

Both the on-site lab and off-site lab are using a similar sample preparation technique, EPA method 5030. An aliquot of the collected soil sample is weighed and placed into an extraction vial followed by the addition of a known volume of GC grade methanol. Soil and solvent volumes are dependent upon the expected concentration of the sample, known high concentration soils will require a smaller soil volume for extraction. The soil/ methanol is thoroughly mixed and allowed to settle. A known aliquot of extract is then removed and added to a known volume of water in a 40ml purge vial. This vial is then placed into the purge and trap mechanism and introduced into the GC (on site) for analysis using an electron captures detector (ECD). Standard lab QC including surrogates duplicates, method blanks, and checks standards are also conducted in the on-site laboratory.

To validate the use of the extract combination technique at the off-site lab, as well as the correlation between on-site and off-site sample results. OHM developed a study using a series of soil samples were "split" between labs. Both treated soils, which were expected to yield non-detect results, and feed soils were selected. For several samples the off-site lab was requested to analyze the samples using both methods, combining the six extracts before analysis and averaging the result of six individual analyses.

RESULTS

The results for the study samples are presented in Table 1. Off-site laboratory analysis reports are provided as Appendix A. Note that samples designated "F" are feed soil samples and "T" designated samples are from treated soil stockpiles. Since it was agreed that PCA would be the primary indicator compound for the project, these results are bolded and italicized for ease of comparison. A simple graphical presentation of the data is also provided.

In summary, the results of the study yielded positive results for many of the study parameters examined, as presented below.

Combining extracts versus averaging samples

Analysis of samples T005, T006, F011, F031, F032, and F033 were conducted using both techniques by the off-site laboratory. Although samples T005 A-F and T006 A-F were all non-detect as expected, one could state this also shows a 100 % correlation. Samples F031 and F032 also displayed excellent reproducibility between the six sample average and combined extract result, and are even well within the 20% RPD (relative percent difference) value for duplicate analyses generally accepted for volatiles analysis.

Also note that sample F011 was first run as a combined extract only on 8/11/00, yielding a result of 4.9 ppm. OHM then requested the individual samples to be re-analyzed for the averaging method. These analyses took place on 8/24/00, and the average result (0.415 ppm) indicates that the samples had lost some volatiles content over the two week period.

Correlation between on-site and off-site results

Table 1 also presents a subset of PCA results only for which actual results were obtained (samples F011 E and F were reported ND, so the detection limit value was substituted) by both the on-site and off-site labs. As shown, the statistical correlation value for these two sets of data is calculated to be .936.

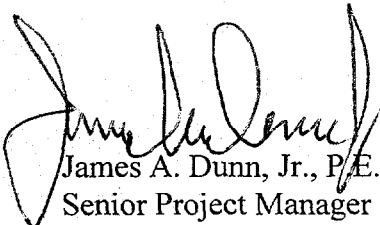
Conclusion

As OHM has experienced, combination of discrete sample extracts is an acceptable procedure for generating a "composite" sample for volatile organic analysis. This is primarily the result of efficient sample extraction. Assuming the majority of the soil contaminants are transferred to the solvent during extraction, and the analyst is accurate in combining equal aliquots of individual extracts carefully, there should be minimal loss of VOC content in the resulting composite extract.

Additionally, very good correlation has been established between the on-site lab and off-site lab PCA results, lending acceptable confidence to field decisions regarding the re-treatment of site soils and delineating final excavation limits.

Should you have any questions or comments regarding these findings, please provide them to me at your convenience.

Very truly yours,
OHM Remediation Services Corp.



James A. Dunn, Jr., P.E.
Senior Project Manager

Attachments

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